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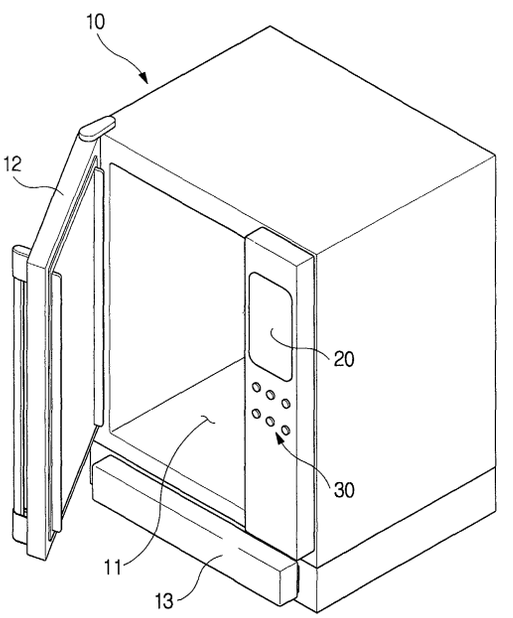
(54) Refrigerator for cosmetics

(57) A refrigerator for storing cosmetics comprises a storage chamber (11) and a cooling unit, an input unit (30), a memory (80) and a control unit (90). The input unit (30) receives command data relating to one or more storage conditions from a user, other than a target temperature, e.g. the user's skin type and the current season. The control means comprises means (80), such as a memory, configured to map command data values onto storage chamber target temperatures. A temperature detecting unit (42) detects the current temperature of the storage chamber. The control unit (90) then controls operation of the cooling unit on the basis of the corresponding storage chamber target temperature, derived from the inputted command data, and the current temperature of the storage chamber.

FIG 1



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Description

[0001] The present invention relates to a refrigerator for cosmetics comprising a storage chamber, cooling means for cooling the storage chamber, a control unit for controlling operation of the cooling means in dependence on target temperature for said chamber and an input unit for receiving user inputs for controlling the refrigerator.

[0002] In general, cosmetics serve to protect the skin, preserve moisture, and prevent impurities in the atmosphere from being brought into contact with the skin. Cosmetics may deteriorate if they are kept in normal atmospheric conditions. If deteriorated cosmetics are used on the skin, this may result in clogging of pores, roughness and skin diseases. It is therefore desirable to preserve cosmetics in a low humidity and cool environment.

[0003] The present invention is intended to provide a refrigerator for cosmetics and a control method thereof, where the refrigerator optimally preserves cosmetics at a temperature that is best suitable for a user's skin type and the season.

[0004] A refrigerator according to the present invention is characterised in that the input unit is configured to receive command data other than a target temperature and the control means is configured to determine storage chamber target temperatures in dependence on command data input by means of the input unit.

[0005] Preferably, the control means comprises means, e.g., a memory, configured to map command data values onto target temperatures for the storage chamber.

[0006] The above and other objects, features and other advantages of the present invention will be more clearly understood and more readily appreciated from the following detailed description taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of a refrigerator for cosmetics in accordance with an embodiment of the present invention;

Figure 2 is a sectional view of the refrigerator for cosmetics shown in Figure 1;

Figure 3 is a partial enlarged view of the refrigerator shown in Figure 2;

Figure 4 is a block diagram of the refrigerator for cosmetics in accordance with an embodiment of the present invention;

Figure 5 is a table showing results of a test to determine skin types, in which subjects who were randomly selected irrespective of their skin types were tested for the feelings experienced when using of the cosmetics to select optimal temperature conditions;

Figures 6 to 9 are tables showing test results of the subjects with oily skin type according to spring, summer, fall and winter, respectively;

Figures 10 to 13 are tables showing test results of the subjects with combination skin type according to spring, summer, fall and winter, respectively;

Figures 14 to 17 are tables showing test results of the subjects with sensitive skin type according to spring, summer, fall and winter, respectively;

Figures 18 to 21 are tables showing test results of the subjects with weak dry skin type according to spring, summer, fall and winter, respectively;

Figures 22 to 25 are tables showing test results of the subjects with dry skin type according to spring, summer, fall and winter, respectively; and

Figure 26 is a flowchart showing a method of controlling the refrigerator for cosmetics in accordance with an embodiment of the present invention.

[0007] Figure 1 is a perspective view of a refrigerator for cosmetics in accordance with an embodiment of the present invention. In the refrigerator, a box-shaped cabinet 10 provides a storage chamber 11. A door 12 is positioned at a front opening of the cabinet 10 to open and close the storage chamber 11. A drawer 13 is provided in a lower portion of the cabinet 10. A display 20 to display information and an input unit 30 to receive commands from a user are formed on one side of the front of the cabinet 10.

[0008] Figure 2 is a sectional view of the refrigerator of Figure 1. The cabinet 10 includes an insulating wall 14 that is shaped in the form of a box and defines the storage chamber 11. The door 12 is situated in the front opening of the cabinet 10 to selectively open and close the storage chamber 11.

[0009] As shown in Figures 2 and 3, a thermoelectric element 51 is provided with a heat absorbing part 51a and a heat dissipating part 51b and contained in a rear portion of the insulating wall 14 of the cabinet 10. The heat absorbing part 51a of the thermoelectric element 51 is oriented toward the storage chamber 11 and an interior heat exchanger 62 is attached to the heat absorbing part 51a. An air blowing fan 63 is mounted on the rear portion of the insulating wall 14 above the interior heat exchanger 62 to circulate the cooling air. The interior heat exchanger 62 and the air blowing fan 63 are surrounded by a cooling air duct 61 in the storage chamber 11.

[0010] A cooling air inlet 61a is formed in a lower portion of the cooling air duct 61 to suck the cooling air that has been circulated within the storage chamber 11. A cooling air outlet 61b is formed in an upper portion of the cooling air

duct 61 in the vicinity of the air-blowing fan 63 to discharge the cooling air. The discharged cooling air has exchanged heat with the interior heat exchanger 62 prior to being discharged to the storage chamber 11.

[0011] The heat emitting unit of the thermoelectric element 51 is oriented with its back toward the storage chamber 11. A thermal conductor 52 and an exterior heat exchanger 72 are attached to the heat dissipating part 51b of the thermoelectric element 51. A heat dissipating fan 73 is mounted on the upper portion of the insulating wall 14 above the external heat exchanger 72. The external heat exchanger 72 and the heat dissipating fan 73 are surrounded by a heat dissipation duct 71. The thermal conductor 52 serves to transfer heat generated in the heat emitting unit of the thermoelectric element 51 to the exterior heat exchanger 72. The thermal conductor 52 is made of aluminum that has excellent heat conductivity, however it is understood that other materials having excellent heat conductivity can be used.

[0012] A heat dissipation outlet 71b is formed on an upper portion of the heat dissipation duct 71 to discharge air that has exchanged heat with the exterior heat exchanger 72 to the outside atmosphere. An outside air inlet 71a is formed on a lower portion of the heat dissipation duct 71 to suck air from the outside atmosphere.

[0013] A drain 64 is provided to drain water droplets formed on a surface of the interior heat exchanger 62. A tray 65 is positioned under the cabinet 10 to collect the water droplets drained through the drain 64. Part of the tray 65 is exposed to the heat dissipation duct 71 to allow the water collected in the tray 65 to be evaporated by heat generated by the exterior heat exchanger 72. The evaporated water is discharged to the heat dissipation outlet 71b by the action of the heat dissipating fan 73.

[0014] Figure 4 is a block diagram of the refrigerator for cosmetics, which includes a control unit 90 to control the operation of the refrigerator. The input unit 30, which receives commands and information from a user, is electrically connected to the control unit 90. The input unit 30 receives skin type information, e.g., oily skin, combination skin, sensitive skin, weak dry skin or dry skin, and season information, such as spring, summer, fall or winter, as well as a variety of operation commands from the user. Keys are provided on the input unit 30 to facilitate user input. The control unit 90 is a computer that implements the method shown in Figure 26 using a computer program encoded on a computer readable medium.

[0015] The cosmetic refrigerator further includes a storage unit 80 that stores temperature data for the storage chamber 11. The temperature data comprises preset values according to the skin types and seasons. The cosmetic refrigerator further includes a thermoelectric element drive 101 connected to the control unit 90 to operate the thermoelectric element 51, a fan drive 102 to operate the air blowing fan 63 and the heat dissipating fan 73, and a display drive 103 to operate the display 20.

[0016] Cosmetics may be defined as chemical articles that are applied to the body, with the aesthetic aim of beautifying the body to appeal to others, with few, if any, negative effects on the body and/or with the aim of cleansing or maintaining the outer body, such as the skin and hair, in a healthy condition. Generally, the quality of cosmetics is determined according to function, guarantee, organoleptic and emotional aspects. In one aspect of their function, cosmetics are required to maintain the skin in a beautiful and attractive state. Also, cosmetics safeguard the skin without side effects, protecting the skin from microorganism infection and preventing harm due to sunlight. The organoleptic quality of cosmetics is determined by evaluating the agreeability of the cosmetics to the human senses, including the senses of touch, sight and smell, and the senses concerning coolness and warmness. The emotional quality is concerned with psychological feelings experienced during the use of the cosmetics.

[0017] These four qualities are not independent, but are closely connected with one another. In surveys of customers carried out to determine what factors affect their choice when purchasing cosmetics, most answers related to feelings experienced on use. Thus, the feelings experienced by the user on application of the cosmetic to the skin is the most important factor for the customer when determining which cosmetics to purchase, rather than the functional quality of cosmetics.

[0018] The feelings experienced when using cosmetics differs from person to person and is greatly affected by the environment. The personal differences depend on age, skin type, skin thickness and skin sensitivity, while environmental factors include weather conditions and environmental pollution of the place where the consumers live. The refrigerator stores the cosmetics under optimal conditions, where the optimal conditions are determined using temperature data with parameters related to personal skin types and seasonal temperature changes, so that the cosmetics can provide consumers with the best possible feelings on use.

[0019] The following parameters are used as objective measures of the feelings experienced by a consumer when using the cosmetics: appearance, pick-up, rub-out and after-feel.

[0020] Appearance: To evaluate the appearance, a standard vessel is filled with the cosmetic material to a predetermined level and organoleptic tests are performed. No limitation is placed on the evaluation time. Parameters used for evaluating appearance include lustre, viscosity, and mildness. Lustre indicates the degree to which light is reflected from the article as observed with the naked eye. The lustre is graded from zero (no lustre) to 14 (high lustre). The viscosity is inversely proportional to the fluidity of the article and is graded from zero (no viscosity) to 14 (high viscosity). Mildness reflects the perceived texture of the article or the uniformity of constituent particles.

[0021] Pick-up: pick-up is evaluated when cosmetic material is taken from a vessel by the fingers. The forces and

sensations felt when the fingers are brought into contact with the cosmetic material and when the fingers with a part of the cosmetic material attached are separated from the cosmetic material pool and the quantity of the material picked up on the fingers are all parameters for evaluation. The pick-up item is evaluated in terms of firmness, adhesiveness and cohesiveness. Firmness indicates the hardness felt upon pressing the material with the fingers, and is graded from zero (soft) to 14 (hard). Adhesiveness indicates the difficulty felt upon separating the fingers from the cosmetic material contained in a vessel and is graded from zero (easy) to 14 (difficult). Cohesiveness means the extent to which particles of the cosmetic material conglomerate to each other, and is graded from zero (no conglomeration) to 14 (extensive conglomeration).

[0022] Rub-out: This test is concerned with the feelings experienced by a user after application of the cosmetics. Cosmetic materials are applied to a 4 x 4 cm^2 skin area which is marked on the back of the hand and cleansed with 70% alcohol. After 1 min, a 50 µl aliquot of the cosmetic materials is applied to the cleansed area. The following parameters are then evaluated: slipperiness 1, oiliness, spreadability, thickness, moistness, slipperiness 2 and absorption rate. Slipperiness 1, oiliness, spreadability, thickness, and moistness are based on the feelings experienced by the user 10 seconds after application. Slipperiness 2 is checked only if the feeling experienced at 10-20 sec after the application is quite different from that experienced for the first 10 sec. The absorption rate is evaluated 2 minutes after the application of cosmetics.

a. Slipperiness 1 quantifies the extent to which cosmetics are slippery on the skin (cosmetics are not or are slowly absorbed into the skin owing to their high oil content or for other reasons, remaining incompatible with the skin, i.e., slippery), and is graded from zero (not slippery) to 14 (highly slippery).
b. Oiliness measures the greasy feeling obtained during the application of the cosmetic and is graded from zero (not oily) to 14 (highly oily).
c. Spreadability measures the ease of spreading cosmetics upon application to the skin and is graded from zero (stiff) to 14 (highly spreadable).
d. Thickness is concerned with the heaviness or closeness felt during the application and is graded from zero (none) to 14 (very high).
e. Moistness is concerned with the moisture content felt during the application and is graded from zero (none) to 14 (very high).
f. Slipperiness 2 quantifies the change in slipperiness experienced by the user (this is measured in the case that there is a large change in slipperiness 30 sec after the application) and is graded from zero (not slippery) to 14 (highly slippery).
g. The absorption rate is determined by the time it takes to reach the point where the cosmetics "disappear" into the skin, i.e., where there is no longer any feeling of moistness and no detection of resistance upon spreading the cosmetics on the skin with fingers, and is graded from zero (slow) to 14 (fast).

[0023] After-feel: This test is concerned with the feeling 2 minutes after the application of cosmetics. The after-feel parameters include gloss, moistness, oiliness, smoothness, stickiness, and residual feeling.

a. Gloss quantifies the degree to which light is reflected from the skin as observed with the naked eye, and is graded from zero (no gloss) to 14 (high gloss).
b. Moistness is concerned with the feeling related to moisture, moisture + oil, and oil, felt on the skin area applied with cosmetics, and is graded from zero (no moistness) to 14 (high moistness).
c. Oiliness is concerned with the oily feeling felt on the skin area applied with cosmetics, and is graded from zero (no oiliness) to 14 (high oiliness).
d. Smoothness expresses the softness (i.e., slipperiness + smoothness) of the skin when the cosmetics are applied, and is graded from zero (no smoothness) to 14 (high smoothness).
e. Stickiness expresses the degree to which the fingers are stuck to the skin area to which cosmetics have been applied, and is graded from zero (no stickiness) to 14 (high stickiness).
f. Residual feeling is concerned with the weighty sensation or closeness felt after the absorption of cosmetics into the skin, based on the relative difference from the skin applied with no cosmetics, and is graded from zero (no difference in feeling) to 14 (large difference in feeling).

[0024] Subject groups (i.e., professional panels) were set up according to skin type, each consisting of 20 persons who were sensitive to all of the test items, for testing skin lotions and milk lotions. The results are shown in Figures 5 to 26.

[0025] First, before undergoing a test used to determine their skin types, 20 subjects were randomly selected irrespective of skin type and were tested for the feeling on use of the cosmetics to primarily select optimal temperature conditions. The results of the test are given in Figure 5. Higher grades in the test items gloss, smoothness, spreadability,

moistness, absorption rate, and moist feeling indicate better cosmetics. Also, lower grades in the test items oiliness, stickiness, and residual feeling are produced by better cosmetic products. Optimal points were found in the test items viscosity, firmness, adhesiveness, cohesiveness and slipperiness 1, as shown in the preference test of Figure 5. In the test, the optimal temperatures were determined on the basis of the temperatures at which the test items gloss, smoothness, spreadability, moistness, and absorption rate are graded high and at which the test items oiliness, stickiness and residual feeling are graded low. Total points are expressed as the test item preference. As is apparent from Figure 5, the optimal temperature points fall within the range of 10-20 °C. Based on this data, detailed tests were conducted according to skin types and seasons.

[0026] Figures 6 to 9 give test results of the subjects with oily skin type according to spring, summer, fall and winter, respectively. The results demonstrate that optimal temperatures for oily skin type, as measured by the preference scores, are 17 °C, 15 °C, 17 °C, and 18 °C in spring, summer, fall and winter, respectively.

[0027] Figures 10 to 13 give test results of the subjects with combination skin type according to spring, summer, fall and winter, respectively. The results demonstrate that optimal temperatures for combination skin type, as measured by the preference scores, are 17 °C, 15 °C, 17 °C, and 18 °C for spring, summer, fall and winter, respectively.

[0028] Figures 14 to 17 give test results of the subjects with sensitive skin type according to spring, summer, fall and winter, respectively. The results demonstrate that optimal temperatures for sensitive skin type, as measured by the preference scores, are 17 °C, 15 °C, 17 °C, and 18 °C in spring, summer, fall and winter, respectively.

[0029] Figures 18 to 21 give test results of the subjects with weak dry skin type according to spring, summer, fall and winter, respectively. The results demonstrate that optimal temperatures for weak dry skin type, as measured by the preference scores, are 17 °C, 15 °C, 17 °C, and 18 °C for spring, summer, fall and winter, respectively.

[0030] Figures 22 to 25 give test results of the subjects with dry skin type according to spring, summer, fall and winter, respectively. The results demonstrate that optimal temperatures for dry skin type, as measured for the preference scores, are 19 °C, 17 °C, 17 °C, and 18 °C for spring, summer, fall and winter, respectively.

[0031] The optimal temperature conditions, taken together from the above tests, are summarized in Table 1, below. This temperature condition data is stored in the storage unit 80.

TABLE 1:

Temperature Condition According to Skin Types and Seasons					
		Season			
		Spring	Summer	Fall	Winter
Skin type	Oily skin	15°C	13°C	15°C	16°C
	Combination skin	17°C	15°C	17°C	18°C
	Sensitive skin	17°C	15°C	17°C	18°C
	Weak dry skin	17°C	15°C	17°C	18°C
	Dry skin	19°C	17°C	19°C	20°C

[0032] Figure 26 is a flowchart showing a method of controlling a cosmetic refrigerator according to an embodiment of the present invention.

[0033] A user inputs information on their skin type via the input unit 30, e.g., whether their skin type is oily, combination, sensitive, weak and dry or dry. The input unit 30 transmits the skin type information to the control unit 90. The control unit 90 receives the skin type information transmitted from the input unit 30, and sets the skin type of the user (step S10). The user also inputs information relating to the current season, e.g., whether it is presently spring, summer, fall or winter. The input unit 30 transmits the current season information to the control unit 90, which sets the current season (step S20).

[0034] The control unit 90 then retrieves a reference internal temperature for the cosmetic refrigerator for the set parameters from a look up table stored in the storage unit 80. The table stores a plurality of possible combinations of skin type and season parameters with corresponding reference internal temperatures. The control unit 90 then uses the reference internal temperature to set a control condition (step S30).

[0035] The control unit 90 detects the internal temperature of the cosmetic refrigerator through the temperature detecting unit 42 (step S40). The control unit 90 compares the detected temperature with the temperature of the set control condition (step S30). To this end, in step S50, the control unit 90 determines whether the temperature detected through the temperature detecting unit 42 (step S40) is higher than the temperature of the control condition set in step S30.

[0036] If it is determined that the detected temperature is higher than the temperature of the control condition (step S50), the control unit 90 causes the thermoelectric element drive unit 101 to operate the thermoelectric element 51 (step S60). Additionally, the control unit 90 causes the fan drive unit 102 to operate the air-blowing fan 63 and the heat dissipating fan 73 (step S70).

[0037] When the thermoelectric element 51 is operated, the heat absorbing part 51a serves to absorb heat, while the heat dissipating part 51b emits heat. Through operation of the air-blowing fan 63, the air in the storage chamber 11 is sucked through cooling air inlet 61a of the cooling air duct 61, cooled by heat exchange with the interior heat exchanger 62, and discharged to the storage chamber 11 through the cooling air outlet 61b of the cooling air duct 61. Any moisture contained in the air forms water droplets on the interior heat exchanger 62 by the heat exchanging operation, which are collected in the tray 65 through the drain 64. As a result, the moisture contained in the storage chamber 11 can be reduced easily and effectively.

[0038] In addition, through operation of the heat dissipating fan 73, outside air is sucked through the outside air inlet 71a formed on the heat dissipation duct 71, heated by heat exchange with the exterior heat exchanger 72, and discharged through the heat dissipation outlet 71b to the outside. At this time, any water collected in the tray 65 is evaporated by heat transferred from the exterior heat exchanger 72, and is discharged through the heat dissipation outlet 71b.

[0039] If it is determined that the detected temperature is not higher than the temperature required by the control condition (step S50), the control unit 90 causes the thermoelectric element drive unit 101 to stop operation of the thermoelectric element 51 (step S51) and causes the fan drive unit 102 to stop the air blowing fan 63 and the heat dissipating fan 73 (step S52).

[0040] Through use of the refrigerator and control method described above, in which cosmetics can be preserved at a low temperature and a low humidity, where the temperature is set according to a user's skin type and a current season. By keeping the cosmetics in such conditions, the user's experience when applying the cosmetics is optimized.

[0041] Although a preferred embodiment of the present invention has been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope of the invention as disclosed in the accompanying claims.

Claims

1. A refrigerator for cosmetics comprising a storage chamber (11), cooling means for cooling the storage chamber, a control unit (90) for controlling operation of the cooling means in dependence on target temperature for said chamber and an input unit (30) for receiving user inputs for controlling the refrigerator, **characterised in that** the input unit (30) is configured to receive command data other than a target temperature and the control means is configured to determine storage chamber target temperatures in dependence on command data input by means of the input unit.

2. A refrigerator according to claim 1, in which the control means comprises means (80) configured to map command data values onto target temperatures for the storage chamber.

3. A refrigerator according to claim 1 or 2, in which the input unit (30) is configured to receive command data relating to an environmental condition.

4. A refrigerator according to any of claims 1 to 3, in which the input unit (30) is configured to receive command relating to a personal condition of a user.

5. A refrigerator for cosmetics, the refrigerator having a storage chamber and a cooling means for cooling the storage chamber, comprising:

   an input unit for receiving one or more storage conditions from a user;
   a storage unit for storing storage reference temperatures predetermined to correspond to possible storage conditions;
   a temperature detecting unit for detecting a temperature of the storage chamber; and
   a control unit for controlling an operation of the cooling means on the basis of the storage conditions inputted through the input unit, a corresponding reference storage temperature stored in the storage unit and the temperature of the storage chamber detected by the temperature detecting unit.

6. The refrigerator according to claim 5, wherein the storage condition is a personal condition or an environmental

condition.

7. The refrigerator according to claim 5, wherein the storage conditions are a personal condition and an environmental condition.

8. The refrigerator according to claim 6 or 7, wherein the personal condition is a skin type that corresponds to one of an oily skin, a combination skin, a sensitive skin, a weak dry skin and a dry skin.

9. The refrigerator according to claim 6 or 7, wherein the environmental condition is a season that corresponds to one of spring, summer, fall and winter.

10. The refrigerator according to claim 5, wherein the cooling means is a thermoelectric element whose heat absorbing part is oriented toward the storage chamber to cool the storage chamber.

11. The refrigerator according to claim 10, further comprising:

an interior heat exchanger brought into contact with the heat absorbing part of the thermoelectric element for cooling air by heat exchange;
an air blowing fan for circulating air cooled by the interior heat exchanger across the storage chamber;
a cooling air duct adapted to surround the thermoelectric element, the interior heat exchanger and the air blowing fan and provided with an air inlet for sucking air from the storage chamber and an air outlet for discharging air cooled by the interior heat exchanger;
an exterior heat exchanger brought into contact with the heat emitting part of the thermoelectric element for exchanging heat with outside air;
a heat dissipating fan for circulating outside air to exchange heat with the exterior heat exchanger; and
a heat dissipation duct adapted to surround the exterior heat exchanger and the heat dissipating fan and provided with an air inlet for sucking air from the outside and an air outlet for discharging air heated by the exterior heat exchanger.

12. The refrigerator according to claim 11, further comprising a drain part formed in a lower portion of the cooling air duct for discharging water droplets formed on the interior heat exchanger and an evaporating tray for collecting water droplets discharged through the drain part.

13. The refrigerator according to claim 12, wherein the evaporating tray is partially exposed to the heat dissipation duct so that water droplets collected in the evaporating tray can be evaporated by heat generated by the exterior heat exchanger.

14. A method of controlling a refrigerator for cosmetics, the refrigerator having a storage chamber and a cooling means for cooling the storage chamber, comprising the steps of:

setting one or more storage conditions;
searching for one of reference storage temperatures, which are predetermined to correspond to possible storage conditions, corresponding to the set storage condition; and
operating the cooling means to maintain a temperature of the storage chamber at the searched reference storage temperature.

15. The refrigerator according to claim 14, wherein the storage condition is a personal condition or an environmental condition.

16. The refrigerator according to claim 14, wherein the storage conditions are a personal condition and an environmental condition.

17. The refrigerator according to claim 15 or 16, wherein the personal condition is a skin type that corresponds to one of an oily skin, a combination skin, a sensitive skin, a weak dry skin and a dry skin.

18. The refrigerator according to claim 15 or 16, wherein the environmental condition is a season that corresponds to one of spring, summer, fall and winter.

FIG 1

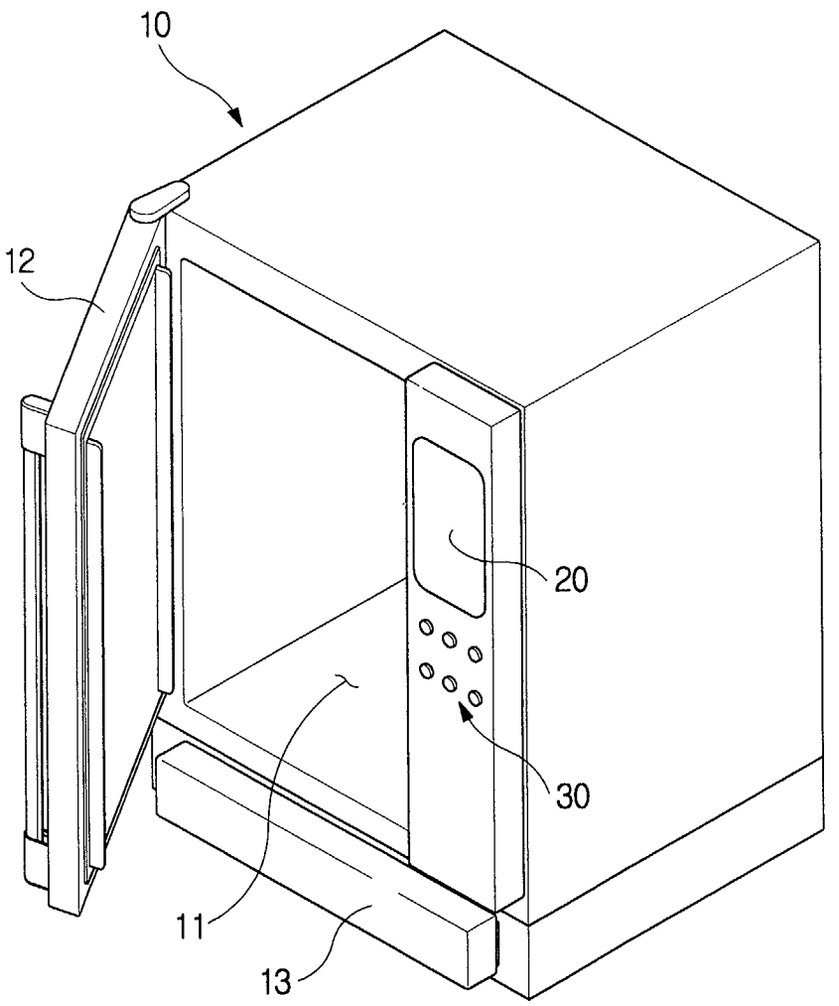


FIG 2

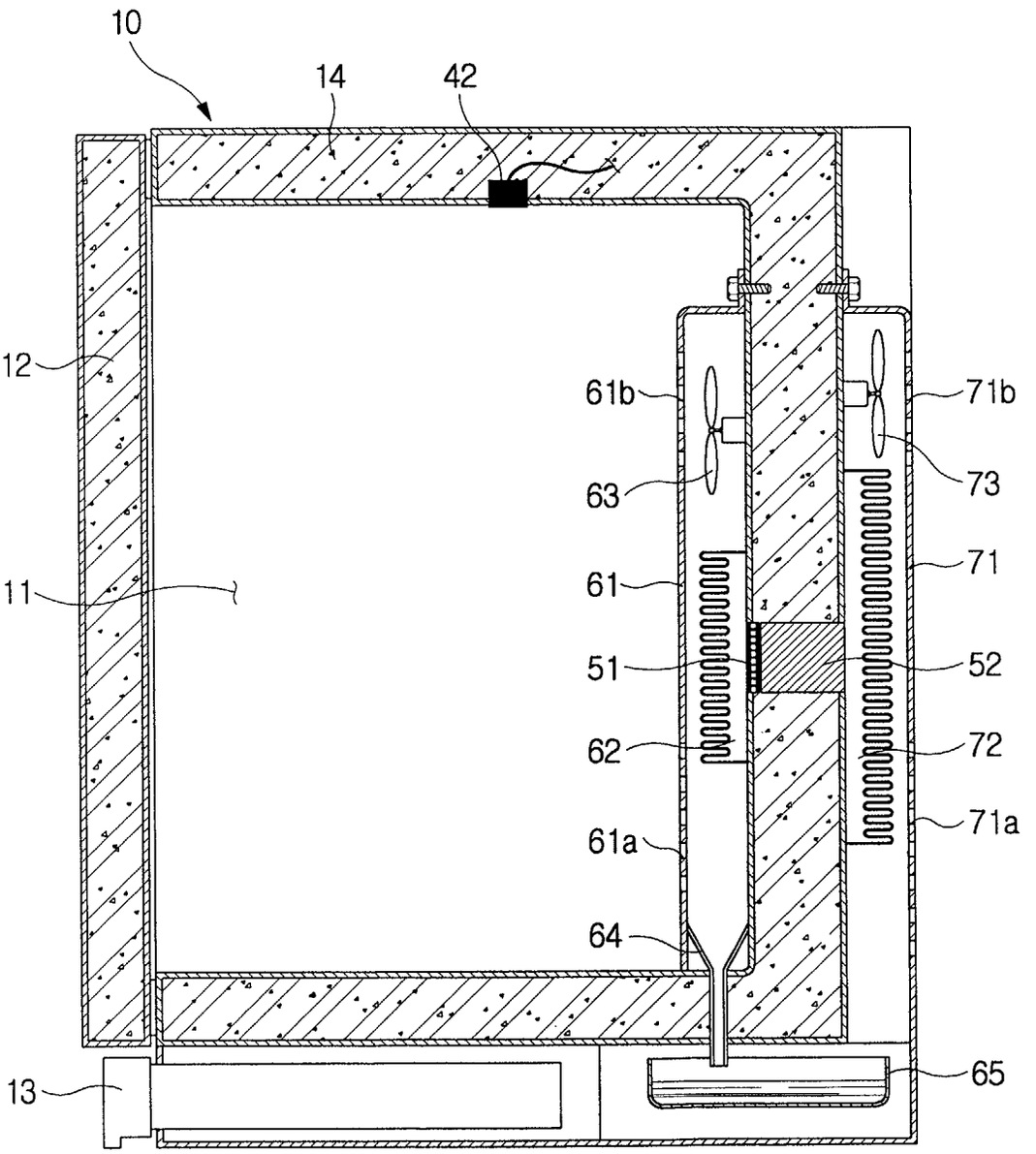
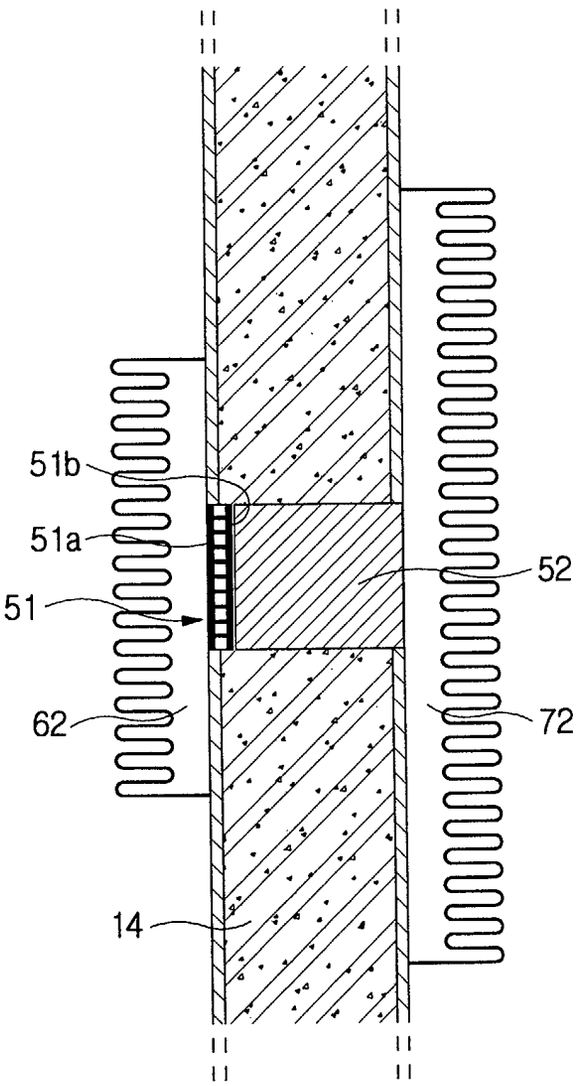


FIG 3



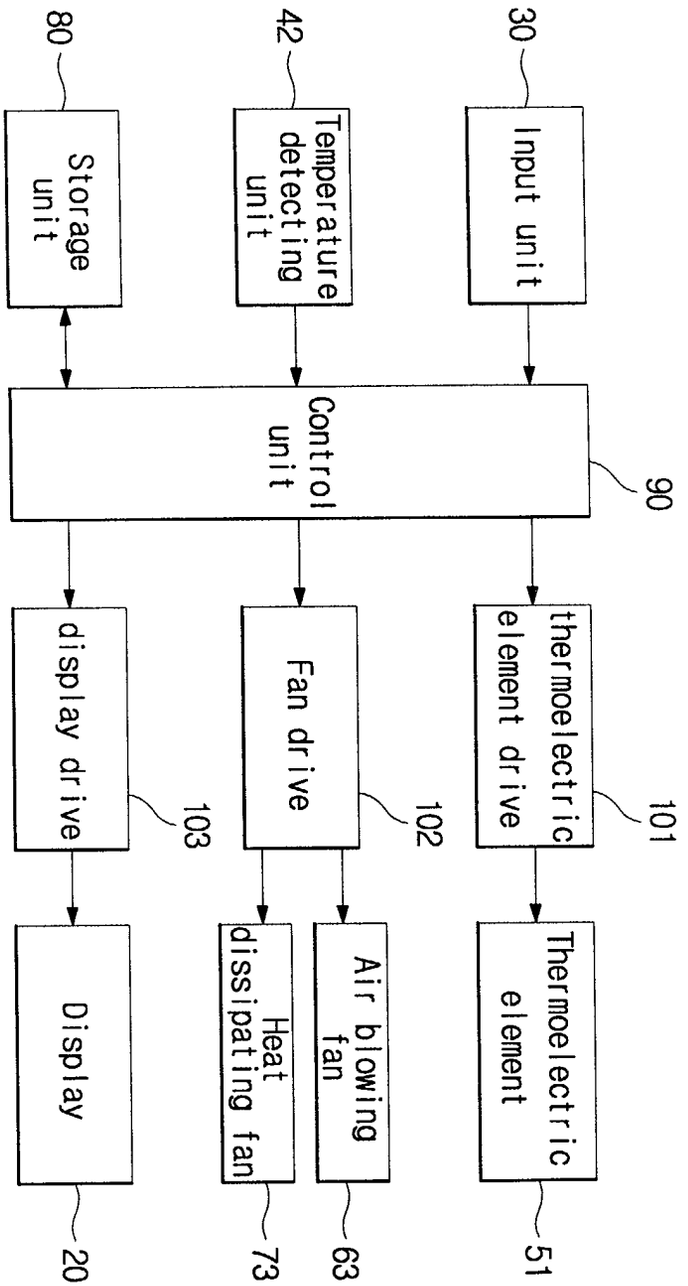

30
Input unit
42
Temperature detecting unit
80
Storage unit
Control unit
90
thermoelectric element drive
101
Fan drive
102
display drive
103
Thermoelectric element
51
Air blowing fan
63
Heat dissipating fan
73
Display
20

FIG 4

FIG 5

Evaluation item		10℃	15℃	20℃	25℃	30℃
Appearance	Luster	9.80	10.50	9.20	8.60	7.50
	Viscosity	11.40	10.50	9.00	8.60	7.60
	Mildness	9.10	9.50	8.50	7.60	7.10
Pick-up	Firmness	8.00	7.00	6.00	5.00	4.00
	Adhesiveness	7.20	6.50	5.40	4.20	3.50
	cohesiveness	7.30	6.40	5.60	4.40	3.20
Rub-out	Slipperiness 1	6.30	6.70	6.50	6.60	6.60
	Oiliness	5.50	6.00	6.50	7.00	7.70
	Spreadability	8.20	8.50	7.80	7.40	8.50
	Thickness	9.20	8.50	7.80	6.80	5.40
	Moistness	8.50	8.80	7.50	6.60	5.40
	Slipperiness 2	4.50	5.50	5.20	4.20	5.60
	Absorption rate	8.50	10.50	9.20	7.80	5.60
After-feel	Gloss	7.50	8.60	7.40	6.40	5.30
	Moist feeling	10.00	11.00	9.20	8.40	5.60
	oiliness	4.20	4.50	5.50	6.60	7.60
	Smoothness	8.50	9.20	8.20	7.60	8.00
	Stickiness	5.50	5.30	6.50	7.00	7.50
	Residual feeling	9.20	8.50	7.80	7.60	7.20
Total feeling	Preference (Perfect score:5)	4	5	4	3	2

FIG 6

1)Spring

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	9.80	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	8.20	8.30	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.60	8.80	8.20	7.50
	Slipperiness 2	4.50	4.70	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.50	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.00	10.20	9.20
	oiliness	4.20	4.30	4.50	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 7

2)summer

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	10.00	10.50	10.00	9.20	8.50
	Viscosity	10.80	10.50	9.70	9.00	8.00
	Mildness	9.20	9.50	8.80	8.50	7.80
Pick-up	Firmness	7.50	7.00	6.50	6.00	5.10
	Adhesiveness	6.80	6.50	5.70	5.40	4.50
	cohesiveness	6.80	6.40	6.10	5.60	4.50
Rub-out	Slipperiness 1	6.40	6.70	6.50	6.50	7.20
	Oiliness	5.80	6.00	6.20	6.50	7.60
	Spreadability	8.30	8.50	8.10	7.80	7.50
	Thickness	8.80	8.50	8.00	7.80	6.50
	Moistness	8.60	8.80	8.20	7.50	6.70
	Slipperiness 2	4.70	5.50	5.40	5.20	4.40
	Absorption rate	9.20	10.50	9.60	9.20	8.70
After-feel	Gloss	7.80	8.60	7.80	7.40	6.50
	Moist feeling	10.50	11.00	10.20	9.20	8.00
	oiliness	4.30	4.50	5.10	5.50	6.70
	Smoothness	8.70	9.20	8.60	8.20	8.00
	Stickiness	5.40	5.30	6.20	6.50	7.50
	Residual feeling	8.80	8.50	8.20	7.80	6.70
Total feeling	Preference (Perfect score:5)	4	5	4	3	2

FIG 8

3)Fall

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	9.80	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	8.20	8.30	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.60	8.80	8.20	7.50
	Slipperiness 2	4.50	4.70	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.50	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.00	10.20	9.20
	oiliness	4.20	4.30	4.50	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 9

4)Winter

Evaluation item		12℃	14℃	16℃	18℃	20℃
Appearance	Luster	9.50	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.30	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.70	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.60	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	7.50	7.80	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.70	9.00	8.20	7.50
	Slipperiness 2	4.50	4.90	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.20	10.20	9.20
	oiliness	4.20	4.50	4.80	5.10	5.50
	Smoothness	8.50	8.90	10.10	8.60	8.20
	Stickiness	5.50	5.40	5.10	6.20	6.50
	Residual feeling	9.20	8.90	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 10

1)Spring

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 11

2)Summer

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	9.80	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	8.20	8.30	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.60	8.80	8.20	7.50
	Slipperiness 2	4.50	4.70	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.50	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.00	10.20	9.20
	oiliness	4.20	4.30	4.50	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 12

3)Fall

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 13

4)Winter

Evaluation item		14℃	16℃	18℃	20℃	22℃
Appearance	Luster	9.50	10.00	10.30	10.00	9.20
	Viscosity	11.40	10.80	10.30	9.70	9.00
	Mildness	9.10	9.30	9.90	8.80	8.50
Pick-up	Firmness	8.00	7.70	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.10	5.70	5.40
	cohesiveness	7.60	6.80	6.50	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	7.10	7.80	8.90	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.20	8.70	9.00	8.20	7.50
	Slipperiness 2	4.50	4.90	5.80	5.40	5.20
	Absorption rate	8.00	9.20	10.80	9.60	9.20
After-feel	Gloss	7.10	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.40	10.20	9.20
	oiliness	4.20	4.50	5.00	5.10	5.50
	Smoothness	8.50	8.90	10.10	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.50	8.90	8.30	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 14

1)Spring

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 15

2)Summer

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	9.80	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	8.20	8.30	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.60	8.80	8.20	7.50
	Slipperiness 2	4.50	4.70	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.50	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.00	10.20	9.20
	oiliness	4.20	4.30	4.50	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 16

3)Fall

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 17

4)Winter

Evaluation item		14℃	16℃	18℃	20℃	22℃
Appearance	Luster	9.50	10.00	10.30	10.00	9.20
	Viscosity	11.40	10.80	10.30	9.70	9.00
	Mildness	9.10	9.30	9.90	8.80	8.50
Pick-up	Firmness	8.00	7.70	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.10	5.70	5.40
	cohesiveness	7.60	6.80	6.50	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	7.10	7.80	8.90	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.20	8.70	9.00	8.20	7.50
	Slipperiness 2	4.50	4.90	5.80	5.40	5.20
	Absorption rate	8.00	9.20	10.80	9.60	9.20
After-feel	Gloss	7.10	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.40	10.20	9.20
	oiliness	4.20	4.50	5.00	5.10	5.50
	Smoothness	8.50	8.90	10.10	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.50	8.90	8.30	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 18

1)Spring

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 19

2)Summer

Evaluation item		10℃	13℃	15℃	17℃	19℃
Appearance	Luster	9.80	10.00	10.50	10.00	9.20
	Viscosity	11.40	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.50	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	8.20	8.30	8.50	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.50	8.60	8.80	8.20	7.50
	Slipperiness 2	4.50	4.70	5.50	5.40	5.20
	Absorption rate	8.50	9.20	10.50	9.60	9.20
After-feel	Gloss	7.50	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.00	10.20	9.20
	oiliness	4.20	4.30	4.50	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.50	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 20

3)Fall

Evaluation item		13℃	15℃	17℃	19℃	21℃
Appearance	Luster	9.90	10.20	10.80	10.00	9.00
	Viscosity	11.60	10.80	10.50	9.70	9.00
	Mildness	9.10	9.20	9.80	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.60	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.70	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.10	8.80	8.70	8.30	7.80
	Moistness	8.50	8.60	9.00	8.20	7.50
	Slipperiness 2	4.50	4.70	5.70	5.40	5.20
	Absorption rate	8.50	9.20	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.70	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.20	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.20	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 21

4)Winter

Evaluation item		14℃	16℃	18℃	20℃	22℃
Appearance	Luster	9.50	10.00	10.30	10.00	9.20
	Viscosity	11.40	10.80	10.30	9.70	9.00
	Mildness	9.10	9.30	9.90	8.80	8.50
Pick-up	Firmness	8.00	7.70	7.00	6.50	6.00
	Adhesiveness	7.20	6.80	6.10	5.70	5.40
	cohesiveness	7.60	6.80	6.50	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.20	6.50
	Spreadability	7.10	7.80	8.90	8.10	7.80
	Thickness	9.20	8.80	8.50	8.00	7.80
	Moistness	8.20	8.70	9.00	8.20	7.50
	Slipperiness 2	4.50	4.90	5.80	5.40	5.20
	Absorption rate	8.00	9.20	10.80	9.60	9.20
After-feel	Gloss	7.10	7.80	8.60	7.80	7.40
	Moist feeling	10.00	10.50	11.40	10.20	9.20
	oiliness	4.20	4.50	5.00	5.10	5.50
	Smoothness	8.50	8.90	10.10	8.60	8.20
	Stickiness	5.50	5.40	5.30	6.20	6.50
	Residual feeling	9.50	8.90	8.30	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 22

1)Spring

Evaluation item		15℃	17℃	19℃	21℃	23℃
Appearance	Luster	9.50	10.20	11.20	10.50	9.00
	Viscosity	11.60	10.80	10.70	9.70	9.00
	Mildness	9.30	9.20	10.00	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.80	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.30	8.80	8.50	8.30	7.80
	Moistness	8.50	8.60	9.20	8.20	7.50
	Slipperiness 2	4.50	4.70	5.90	5.40	5.20
	Absorption rate	8.50	9.50	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.90	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.00	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.00	8.60	8.20
	Stickiness	4.30	4.80	5.00	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 23

2)summer

Evaluation item		15℃	17℃	19℃	21℃	23℃
Appearance	Luster	9.50	10.20	11.20	10.50	9.00
	Viscosity	11.60	10.80	10.70	9.70	9.00
	Mildness	9.30	9.20	10.00	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.80	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.30	8.80	8.50	8.30	7.80
	Moistness	8.50	8.60	9.20	8.20	7.50
	Slipperiness 2	4.50	4.70	5.90	5.40	5.20
	Absorption rate	8.50	9.50	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.90	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.00	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.00	8.60	8.20
	Stickiness	4.30	4.80	5.00	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 24

3)Fall

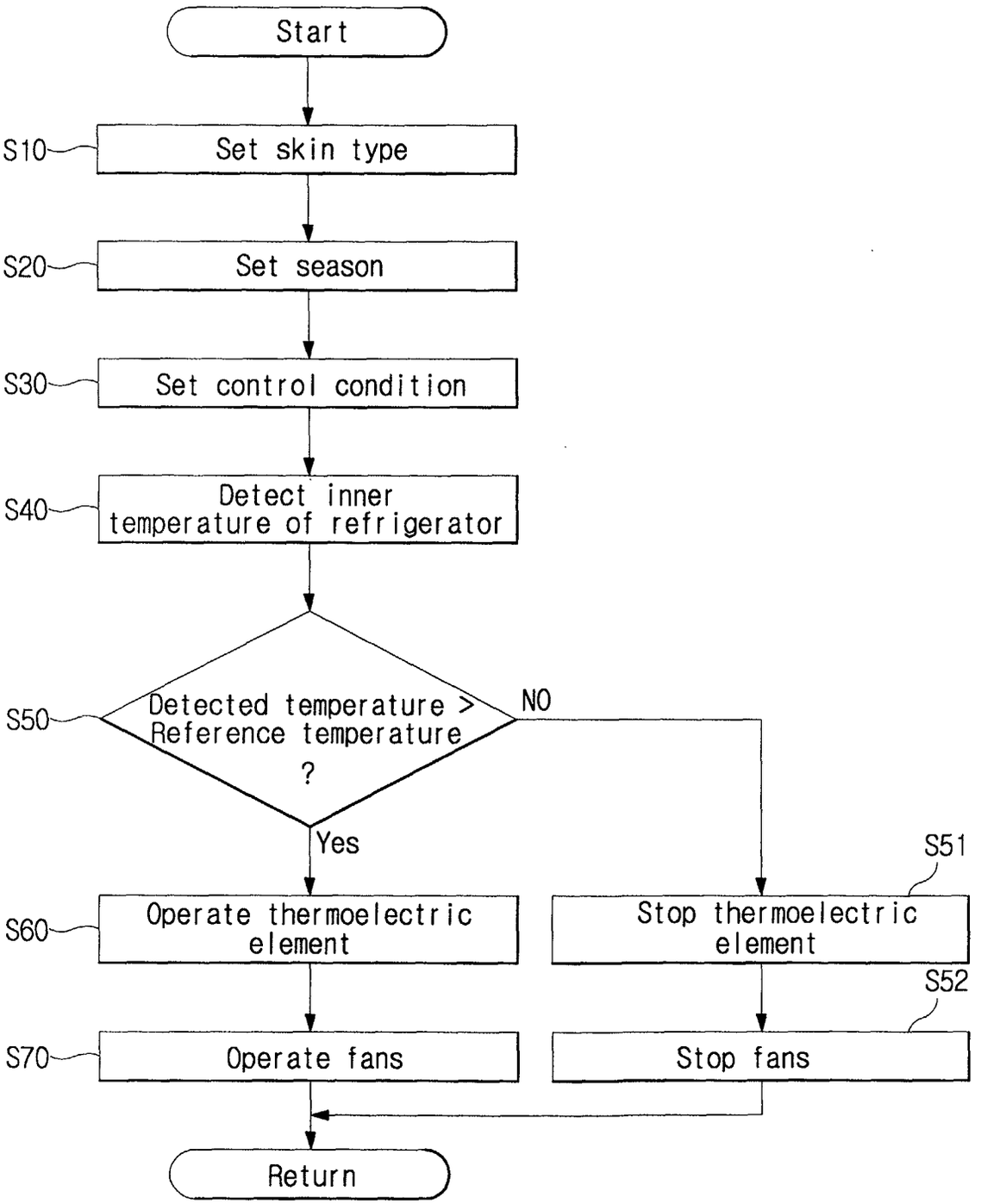
Evaluation item		15℃	17℃	19℃	21℃	23℃
Appearance	Luster	9.50	10.20	11.20	10.50	9.00
	Viscosity	11.60	10.80	10.70	9.70	9.00
	Mildness	9.30	9.20	10.00	8.80	8.50
Pick-up	Firmness	8.00	7.50	7.00	6.50	6.00
	Adhesiveness	7.80	6.80	6.50	5.70	5.40
	cohesiveness	7.30	6.80	6.40	6.10	5.60
Rub-out	Slipperiness 1	6.20	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.30	6.50
	Spreadability	8.00	8.30	8.50	8.10	7.80
	Thickness	9.30	8.80	8.50	8.30	7.80
	Moistness	8.50	8.60	9.20	8.20	7.50
	Slipperiness 2	4.50	4.70	5.90	5.40	5.20
	Absorption rate	8.50	9.50	10.80	9.60	9.20
After-feel	Gloss	7.50	7.80	8.90	7.80	7.40
	Moist feeling	10.00	10.50	11.50	10.20	9.20
	oiliness	4.00	4.30	4.70	5.10	5.50
	Smoothness	8.50	8.70	9.00	8.60	8.20
	Stickiness	4.30	4.80	5.00	6.20	6.50
	Residual feeling	9.20	8.80	8.20	8.20	7.80
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 25

4)Winter

Evaluation item		16℃	18℃	20℃	22℃	24℃
Appearance	Luster	9.50	10.00	10.70	10.00	9.20
	Viscosity	11.40	10.80	10.30	9.70	9.00
	Mildness	9.10	9.30	10.10	8.80	8.50
Pick-up	Firmness	8.00	7.70	7.00	6.50	6.00
	Adhesiveness	7.10	6.80	6.10	5.70	5.40
	cohesiveness	7.60	6.80	6.50	6.10	5.60
Rub-out	Slipperiness 1	6.30	6.40	6.70	6.50	6.50
	Oiliness	5.50	5.80	6.00	6.30	6.50
	Spreadability	7.10	7.80	8.90	8.10	7.80
	Thickness	9.50	8.80	8.50	8.00	7.80
	Moistness	8.20	8.70	9.30	8.20	7.50
	Slipperiness 2	4.50	4.90	5.80	5.50	5.20
	Absorption rate	8.00	9.20	10.50	9.60	9.20
After-feel	Gloss	7.10	7.80	8.40	7.80	7.40
	Moist feeling	10.00	10.50	11.10	10.20	9.20
	oiliness	4.20	4.60	5.00	5.10	5.50
	Smoothness	8.50	8.90	10.10	8.60	8.20
	Stickiness	5.50	5.40	5.60	6.20	6.50
	Residual feeling	9.60	8.90	8.30	8.20	7.90
Total feeling	Preference (Perfect score:5)	3	4	5	4	2

FIG 26


Start
S10
Set skin type
S20
Set season
S30
Set control condition
S40
Detect inner temperature of refrigerator
S50
Detected temperature > Reference temperature ?
NO
Yes
S51
S60
Operate thermoelectric element
Stop thermoelectric element
S52
S70
Operate fans
Stop fans
Return